

1 METHODS AND APPARATUS FOR INTERNATIONAL  
2 CELLULAR TELEPHONE CALLS  
3

4 BACKGROUND OF THE INVENTION  
5

6 1. Field of the Invention

7 The invention relates to telecommunications. More  
8 particularly, the invention relates to international cellular  
9 telecommunications.  
10

11 2. State of the Art

12 To many people, cellular telephones have become a necessity.  
13 Business people who travel frequently rely on cellular telephones  
14 to keep in touch with colleagues and clients. The cellular  
15 telephone networks throughout the civilized world work quite well.  
16 However, if a traveller brings a cellular telephone from one  
17 country to another, problems may arise. In many cases, a cellular  
18 telephone which was activated in one country will not operate at  
19 all in another country. In other cases, the telephone will  
20 operate but not economically as international "roaming" charges  
21 are often quite high.  
22

23 One of the solutions to the problems of international  
24 cellular telecommunications is to rent a local cell phone when

1 visiting a foreign country. These phones are often offered for  
2 rent at car rental agencies. However, the per minute cost of  
3 operating these rented cell phones is up to ten times the per  
4 minute charge usually paid for regular cell phone service. In  
5 addition, these rental phones have a phone number local to the  
6 country in which they are rented. Thus, a call to or from a  
7 rental phone to the home country of the renter will often involve  
8 an expensive international calling rate. Further, the renter will  
9 not know what the phone number is until the phone is rented.  
10 Therefore, the new cell phone number must be circulated to all of  
11 the renter's colleagues and clients if the renter is to be  
12 reachable.

#### 13 14 SUMMARY OF THE INVENTION

15  
16 It is therefore an object of the invention to provide methods  
17 and apparatus for international cellular telephone calls.

18  
19 It is also an object of the invention to provide methods and  
20 apparatus for international cellular telephone calls which allow a  
21 caller to travel to another country and obtain economical cellular  
22 telephone service.

1       It is another object of the invention to provide methods and  
2 apparatus for international cellular telephone calls which allow  
3 the cell phone user to keep the same phone number when traveling  
4 in other countries.

5  
6       It is still another object of the invention to provide  
7 methods and apparatus for international cellular telephone calls  
8 which operate transparently to the callers.

9  
10       In accord with these objects which will be discussed in  
11 detail below, the methods of the present invention include  
12 obtaining cellular telephones numbers in bulk associated with a  
13 cellular telephone service in a destination country, providing  
14 cellular phones which have been programmed with the telephone  
15 numbers to travelers from an origin to the destination country,  
16 providing dedicated switching equipment in the destination  
17 country, and programming the cell phones and the switching  
18 equipment to direct calls to the origin country from the  
19 destination country through the dedicated switching equipment.  
20 Optionally, dedicated switching equipment is provided in the  
21 origin country and all calls from the origin country to the  
22 destination country are routed through the dedicated switching  
23 equipment in the origin country. The apparatus of the invention  
24 includes the cell phones, the switching equipment, and the

1 communication link(s) between the origin and destination  
2 countries. According to the presently preferred embodiment, the  
3 dedicated switching equipment and the cell phones are owned by the  
4 same company or related companies. The communications link(s)  
5 between the origin and destination countries is (are) preferably  
6 leased from another company.

7  
8 In order to allow the user to maintain the same phone number  
9 while traveling in a foreign country (i.e. the destination  
10 country), one method of the invention include forwarding calls  
11 destined for the user's local phone number to the dedicated  
12 switching equipment in the origin country and programming the  
13 dedicated switching equipment to forward these calls to the number  
14 of the cell phone the user rented. Alternatively, methods of the  
15 invention allow for forwarding calls to the user's local phone  
16 number directly to the rented cell phone or assigning a new local  
17 number for forwarding calls to the rented cell phone. In cases  
18 where the local phone number is a cell phone number, the local  
19 cell phone company provides the means for forwarding or  
20 redirecting to the rented phone or to the dedicated switching  
21 equipment. In cases where the local phone number is a wireline  
22 phone number, the local PSTN provides the means for forwarding or  
23 redirecting to the rented phone or to the dedicated switching

1 equipment. Different methods of forwarding/redirecting are disclosed.

2  
3 According to presently preferred aspects of the invention,  
4 local calls in the destination country are processed by switches  
5 of the local cell phone company but international calls are  
6 processed by the dedicated switching equipment in the destination  
7 country. The cell phones and/or the accounts associated with the  
8 cell phones are preferably programmed to direct all international  
9 calls, i.e. all phone numbers starting with an international  
10 dialing code, e.g. zero, to the dedicated switching equipment in  
11 the U.S.. Alternatively, the phones are programmed to speed dial  
12 to the dedicated switching equipment for making international  
13 calls. Billing international calls to a rented phone is  
14 preferably effected using Caller ID. According to a presently  
15 preferred embodiment, the dedicated switching equipment is  
16 signalled when a phone is rented that the phone is "active" and is  
17 signalled when a phone is returned that the phone is "inactive".

18  
19 Additional objects and advantages of the invention will  
20 become apparent to those skilled in the art upon reference to the  
21 detailed description taken in conjunction with the provided  
22 figures.

## BRIEF DESCRIPTION OF THE DRAWINGS

Figure 1 is a simplified flow chart illustrating the methods of the invention; and

Figure 2 is a schematic illustration of the distribution of the apparatus of the invention.

## DETAILED DESCRIPTION OF THE PREFERRED EMBODIMENTS

The invention is described herein with the destination country being the United States and the origin country being some other country. It will be appreciated, however, that the methods of the invention could be applied to any two countries. In addition, for purposes herein, the terms "international" and "outside the U.S." are intended to mean places where a country code must be dialed to effect calls to/from the U.S.

Turning now to Figure 1, a method according to the present invention includes purchasing U.S. cellular telephone numbers in bulk from a U.S. cell phone company as illustrated at 10 in Figure 1. According to the invention, the actual phones need not be purchased or programmed in the U.S. All that is required is that the phones be associated with a valid U.S. cell phone telephone

1 number. Preferably, an arrangement is made with the U.S. cell  
2 phone company that, when the phones are inactive, the monthly  
3 service charge will be minimal and the regular monthly service  
4 charge will be applied only if the phone is used. If actual  
5 phones are purchased in bulk in the U.S., they are optionally  
6 brought out of the U.S. to an origin country as illustrated in  
7 phantom at 12 in Figure 1. Whether the phones are taken to the  
8 origin country or remain in the U.S., they are rented to people  
9 who are traveling from the origin country to the U.S. as indicated  
10 by 14 in Figure 1. Preferably, though not necessarily, before  
11 leaving the origin country, a phone number local to the origin  
12 country is associated with the rented phone as indicated at 16 in  
13 Figure 1. This local number may be the local cell phone number,  
14 home phone number, office phone number, etc. (or all of those  
15 numbers) of the person renting the phone or a "new" local number  
16 assigned at the time of rental. After the local number is  
17 associated with the rented cell phone, all calls to this local  
18 number are forwarded to the rented phone's U.S. phone number as  
19 indicated at 18 in Figure 1. According to the presently preferred  
20 embodiment, one or more designated switches in the U.S. are  
21 associated with the rented phones as indicated at 20 in Figure 1.  
22 All international calls from the rented phone are preferably  
23 routed through this designated switch as shown by 22 in Figure 1.

1 According to one embodiment of the invention, the step of  
2 associating a local phone number with the rented phone (step 16 in  
3 Figure 1) is effected by the process of forwarding all calls  
4 received by the local number(s) directly to the phone number of  
5 the rented phone using the local telephone company equipment.  
6 According to a first alternate embodiment, this step is effected  
7 by the process of forwarding all calls received by the local  
8 number(s) to dedicated switching equipment in the origin country  
9 which forwards the call to the rented cell phone. For the first  
10 alternate embodiment to work, the identity of the number from  
11 which the calls are forwarded must be provided to the dedicated  
12 switching equipment. According to a second alternate embodiment,  
13 a dedicated "new" local phone number is assigned. This new number  
14 is a DID (direct inward dial) number to the dedicated switching  
15 equipment which forwards the call to the rented cell phone. The  
16 renter has the local phone company forward all of his calls to  
17 this new DID number. According to a third alternate embodiment,  
18 The renter does not have calls forwarded to the DID number but  
19 instructs colleagues and clients to call him via the DID number.  
20 As another alternative, the renter can instruct colleagues and  
21 clients to call the U.S. phone number of the rented phone. The  
22 preferred embodiment will depend on the cost of calling the U.S.  
23 from the origin country and the availability of forwarding service  
24 in the origin country. If the service is available and the cost



1 is acceptable, the calls will be forwarded to or directly dialed  
2 to the U.S. cell phone number. If the cost is not acceptable, the  
3 calls will be routed through dedicated switching equipment in the  
4 origin country.

5  
6 In all of these embodiments, the step of associating the  
7 local phone number with the rented phone ("activating") is  
8 performed when or before the renter picks up the phone. When the  
9 rented phone is returned, the local phone number is disassociated  
10 from the phone ("deactivated").

11  
12 Those skilled in the art will appreciate that the methods of  
13 the invention can be performed by providing the rental phones in  
14 the U.S. rather than in another country. Accordingly, the rental  
15 agreement and the assignment of a U.S. phone number may take place  
16 outside the U.S., with the delivery of the cell phone occurring in  
17 the U.S., e.g., at an airport of arrival. Moreover, the rental  
18 agreement, the assignment of a U.S. phone number, and the delivery  
19 of the cell phone may all take place within the U.S. In this  
20 situation, a mechanism must be provided to associate the phone  
21 number local to the origin country with the U.S. cell phone  
22 number. By way of example, the cell phone user may call a  
23 customer service center, or make a call to the origin country to  
24 program the phone number local to the origin country to forward

1 calls to the U.S. cell phone, or call the dedicated switch in the  
2 U.S. or origin country and, through interactive response, request  
3 that the switch call the telephone company in the origin country  
4 and setup the call forwarding.

5  
6 According to presently preferred aspects of the invention,  
7 local calls in the U.S. are processed by switches of the local  
8 cell phone companies but international calls are processed by the  
9 dedicated switching equipment in the U.S. The cell phones are  
10 preferably programmed to speed dial to the dedicated switching  
11 equipment for making international calls. Billing international  
12 calls to a rented phone is preferably effected using Caller ID.

13 According to a presently preferred embodiment, the dedicated  
14 switching equipment is signalled when a phone is rented that the  
15 phone is "active" and is signalled when a phone is returned that  
16 the phone is "inactive".

17  
18 Depending on the international toll rates of the origin  
19 country, calls from the origin country to the rented U.S. cell  
20 phone may be carried by the public network. Alternatively, calls  
21 from the origin country to the rented U.S. cell phone are carried  
22 by a private network between the dedicated switching equipment in  
23 the origin country and in the U.S.

24

1 Referring now to Figure 2, the apparatus of the invention  
2 includes the cell phones 100 which were purchased in bulk from a  
3 U.S. cell phone company, taken outside the U.S., rented outside  
4 the U.S. and carried back to the U.S. as shown by numeral 100a.  
5 The apparatus also includes dedicated switching equipment 102 in  
6 the U.S., communication links 104 to the origin country, and  
7 optionally, dedicated switching equipment 106 in the origin  
8 country. As shown in Figure 2, the switching equipment 102 is  
9 coupled to the U.S. cell phone network. The optional switching  
10 equipment 106 is coupled to the PSTN (not shown) of the origin  
11 country. Both switching equipment 102 and 106 are coupled to the  
12 communication links 104.

13  
14 According to the presently preferred embodiment, the  
15 dedicated switching equipment and the cell phones are owned by the  
16 same company, related companies, or associated companies. The  
17 communications link(s) between the U.S. and the origin country is  
18 (are) preferably leased from another company.

19  
20 It will be appreciated that the dedicated switch may be part  
21 of the cell phone network and leased by the owner of the rental  
22 cell phones. In addition, the cell network may be configured such  
23 that calls between rental phones are free. Moreover, calls to the  
24 dedicated switch can be free of airtime charges. It will also be

1 appreciated that the dedicated switch can be configured to provide  
2 services such as voice mail, call screening/blocking, conference  
3 calling etc. According to the invention, voice mail which is not  
4 retrieved before the rental phone is returned may be forwarded to  
5 the voice mail system of the renter in the country of origin.  
6

7 There have been described and illustrated herein several  
8 embodiments of methods and apparatus for international cellular  
9 telephone calls. While particular embodiments of the invention  
10 have been described, it is not intended that the invention be  
11 limited thereto, as it is intended that the invention be as broad  
12 in scope as the art will allow and that the specification be read  
13 likewise. It will therefore be appreciated by those skilled in  
14 the art that yet other modifications could be made to the provided  
15 invention without deviating from its spirit and scope as so  
16 claimed.